CLAIMS

What is claimed is:

1.   A method in a transmitter of a communications system, comprising:

mapping a data stream to symbols of a symbol constellation to produce a symbol stream;

modulating a signal in accordance with the symbol stream; and

transmitting the modulated signal,

wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and

wherein mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data stream.

2.   The method claimed in claim 1, wherein said mapping comprises:

selecting a constituent constellation in accordance with a first group of transmit data bits;

selecting an I value in accordance with a second group of transmit data bits; and

selecting a Q value in accordance with a third group of transmit data bits.

3.   The method claimed in claim 1, wherein said constituent constellations are square.

4.   The method claimed in claim 1, wherein said plurality of constituent constellations consists of two constituent constellations.

5.   The method claimed in claim 1, wherein said plurality of constituent constellations consists of two square constituent constellations.

6.   The method claimed in claim 1, wherein said plurality of constituent constellations consists of two square constituent constellations of equal size, and

wherein said constituent constellations are offset from one another by one half spacing in the I and Q dimensions within said symbol constellation.

19

7.   A transmitter for a communication system, comprising:

at least one processor; and

storage media coupled to the at least one processor and having stored therein programming instructions for mapping a data stream to symbols of a symbol constellation to produce a symbol stream for transmission,

wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and

wherein mapping the data stream to symbols of the symbol constellation comprises selecting constituent constellations and selecting I and Q values within the selected constituent constellations in accordance with the data stream.

8.   A method in a receiver of a communications system, comprising:

receiving a modulated signal representing a symbol stream generated by mapping a transmit data stream to symbols of a symbol constellation;

demodulating the signal; and

generating a received data stream from the demodulated signal,

wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and

wherein generating the received data stream comprises:

applying the demodulated signal to a plurality of decoders, each of the decoders providing decoding with respect to one of said constituent constellations; and

determining symbols of the symbol stream from outputs of the decoders.

9.   The method claimed in claim 8, wherein said constituent constellations are square.

10.   The method claimed in claim 8, wherein said plurality of constituent constellations consists of two constituent constellations.

11.   The method claimed in claim 8, wherein said plurality of constituent constellations consists of two square constituent constellations.

12.   The method claimed in claim 8, wherein said plurality of constituent constellations consists of two square constituent constellations of equal size, and

wherein said constituent constellations are offset from one another by one half spacing in the I and Q dimensions within said symbol constellation.

13.   A receiver for a communication system, comprising:

at least one processor; and

storage media coupled to the at least one processor and having stored therein programming instructions for generating a received data stream from a demodulated signal representing a symbol stream generated by mapping a transmit data stream to symbols of a symbol constellation,

21

wherein the symbol constellation comprises a plurality of constituent constellations each having independent I and Q mapping, and

wherein generating the received data stream comprises:

applying the demodulated signal to a plurality of decoders, each of the decoders providing decoding with respect to one of said constituent constellations; and

determining symbols of the symbol stream from outputs of the decoders.